REMARKS

Review and reconsideration on the merits are requested.

Turning first to the objection to claims 8 and 9, these claims are cancelled. Withdrawal is requested.

Prior art considered: JP 09-312,361A, the Abstract with U.S. Patent 6,045,927 Nakanishi et al (collectively Nakanishi) being considered; U.S. Patent 4,025,379 Whetstone (Whetstone); U.S. Patent 6,372,062 Masahiro et al (Masahiro); U.S. Patent 5,716,460 Manning (Manning).

The rejections: claims 1, 6 and 9 under 35 U.S.C. § 102(a) as anticipated by Nakanishi. Paragraph 6 of the Action.

Claims 1, 5, 6, 8 and 9 under 35 U.S.C. § 102(b) as anticipated by Whetstone. Paragraph 7 of the Action.

Claims 1, 5, 6, 8 and 9 under 35 U.S.C. § 102(a) as anticipated by Masahiro. Paragraph 8 of the Action.

Claims 2-4, 7 and 10 under 35 U.S.C. § 103(a) as unpatentable over Masahiro, further in view of Manning. Paragraph 9 of the Action.

Claims 2-4, 7 and 10 under 35 U.S.C. § 103(a) as unpatentable over Whetstone in view of Manning. Paragraph 10 of the Action.

The Examiner's reading and application of the prior art is set forth in detail in the Action and will not be repeated here except as needed to understand Applicants' traversal of the rejections, which is now presented.

As a general matter, with respect to the limitation(s) "capable of having either a magnetized state or a demagnetized state", which the Examiner views as (an) intended

use/functional limitation(s), Applicants cast this limitation in positive form so the same should be attached patentable weight.

Masahiro is Avoided as Prior Art

As discussed with the Examiner, the present application is a PCT application having an effective date of 09-10-99. Masahiro is entitled to an effective date under 35 U.S.C. § 102(e) of January 27, 2000. Thus, Masahiro is not prior art against the present application. As a consequence, Applicant submit they have avoided the rejections of Paragraphs 8 and 9 of the Action.

Traversal of Anticipation Rejection based on Nakanishi

The Nakanishi invention is characterized by laminating a high heat conduction layer and a low thermal expansion layer in an alternate fashion. The composite of Nakanishi comprises Cu or Cu alloy layers which are the high heat conduction layers and Fe-Ni layers which are the low thermal expansion layers.

In accordance with Nakanishi, since the heat conductivity of Cu remarkably deteriorates in this situation where another metal is dissolved therein, it is necessary to suppress diffusion of the Fe-Ni based alloy into the Cu layer to keep the diffusion as low as possible. Further, since the Fe-Ni based alloy in Nakanishi has low thermal expansion characteristics, when the Fe-Ni based alloy has a particular composition, it is also necessary to prevent Cu from diffusing into the Fe-Ni alloy layer. Since the Fe-Ni alloy of Nakanishi and the Cu of Nakanishi will dissolve in each other, that is, they will form a solid solution, the above control is quite important.

Simply stated, in Nakanishi, the bonded layer structure is provided while suppressing changes in the characteristics of each of the layers to be as little as possible.

In distinction, it is the object of the present invention to change, by the use of Cu, the soft magnetic characteristics inherent to Fe into hard magnetic characteristics so as to provide a magnet. In this regard, the present invention involves a technique quite distinct from that of Nakanishi where it is mandatory to keep each of the Fe-Ni layers and the Cu layers as is without resulting in any change in these layers.

It seems to be the Examiner's position that the heating temperature in the present invention overlaps with the heating temperature of Nakanishi. However, this overlooks the fact that the thickness of each of the layers which is finally provided by the cold rolling is 25 μm in the case of the embodiment disclosed at col. 8, lines 54-57 of Nakanishi. Thus, each of the layers provided in Nakanishi has a very high thickness, such that none of the layers would be divided by the heat treatment in Nakanishi. Further, the Cu layers in Nakanishi must not be divided in the sense of the present invention because the Cu layers are provided for the purpose of obtaining good heat conduction.

In distinction, in accordance with the present invention, the Cu layers are made so as to have a very fine thickness as shown in Fig. 3, whereupon an even structure can be obtained so that the dividing treatment of the present invention is made possible by the heat treatment of the present invention. Such could not be achieved with the thick layers of Nakanishi.

Thus, even if the heat treatment temperature range of the present invention were to overlap with the heat treatment range of Nakanishi, the step in the present invention which

includes a heat treatment temperature range is quite distinct in result and desired object from that of Nakanishi.

It must further be noted that Fe and Cu as used in the present invention do not substantially dissolve in each other so that they do not form any alloy, for example, an alloy in single layer form. Accordingly, even in the case of a melted or molten material, Cu will be precipitated. By making Cu precipitate in fine form, this placement of magnetic walls and rotation of the magnetic domains are suppressed in the matrix of Fe which inherently has soft magnetism, whereby hard magnetism results (which phenomenon itself, the Inventors believe, is known).

However, in a hardened magnetic Fe-Cu based alloy, Cu is not dissolved, rather, is precipitated, so that it is extremely difficult to obtain an uniform structure insofar as a melting process is concerned.

Further, due to the presence of a Cu phase having a deformation capability which is quite remarkably different from that of Fe in the course of hot working, it is impossible to apply hot working techniques to a Fe-Cu based alloy, with the result that productivity becomes extremely poor.

The present invention thus provides a novel production technique in which the steps of laminating, heat treatment and rolling are combined to improve productivity of the desired alloy in which hard magnetism is desired to be obtained using Cu while, at the same time, overcoming the defects inherent in conventional techniques.

Thus, the present invention is seen to be quite distinct from that of Nakanishi in that in accordance with the present invention by providing a uniform structure, the magnetic characteristics of a soft magnetic layer are converted into a hard magnetic layer (characteristics of soft magnetism converted to characteristics of hard magnetism).

Withdrawal is requested.

Traversal of Anticipation Rejection based on Whetstone.

Whetstone relates to a shielding technique in which it is mandatory to provide a soft magnetic layer for shielding a magnetic field. A conductive layer of material such as, for example, a Cu layer for shielding an electrical field, and an insulating layer which is a high resistive layer are used in combination. It is quite important to note that Whetstone mandates a soft magnetic layer.

In distinction, as earlier explained, the present invention relates to a technique for converting magnetic characteristics of a soft magnetic layer into a hard magnetic layer, which is essentially opposed to the technique of Whetstone which requires a soft magnetic layer (requires soft magnetism).

Further, in order to obtain the necessary shielding characteristics in Whetstone, each of the soft magnetic layers and the conductive layers must be continuous layers which are not divided. If the layers in accordance with Whetstone are divided, the layers could not act as shielding layers, i.e., each of the layers must maintain its independent layer shape.

With respect to adjustment of magnetic characteristics using a heat treatment in Whetstone, the purpose thereof in Whetstone is quite different and distinct from that of the

present invention. In Whetstone, since the heat treatment is performed with respect to the soft magnetic layers present independently of other layers, strain due to rolling, etc., will be relieved, so that it becomes possible to obtain superior soft magnetic characteristics which are preferred for shielding use.

In distinction, in accordance with the present invention the heat treatment called for in claims 3 and 4 is performed after obtaining the particular desired structure, which is not suggested in the prior art as useful to achieve the desired hard magnetism.

Applicants respectfully submit that the characteristics which result from the heat treatment in accordance with the present invention would not be expected by one of ordinary skill in the art.

Accordingly, withdrawal of the rejection based on Whetstone is requested.

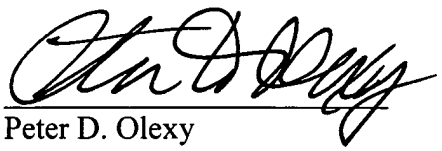
Whetstone in view of Manning

With respect to the rejection based on Whetstone in view of Manning, Applicants rely upon their arguments above.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 8 and 9 are canceled.

The claims are amended as follows:

1. (Amended) A method of producing a magnetic material [capable of] having either a magnetized state or a demagnetized state, comprising the steps of: preparing a multilayer body in which layers 'A" each [containing as the main component thereof] consist essentially of Fe having magnetism and layers 'B" each containing a non-magnetic Cu group metal as the main component thereof are stacked on each other; heating the multilayer body so that each of the layers 'B" is partially divided by a dividing heat treatment; and applying a cold plastic working to the multilayer body.

6. (Amended) A magnetic material [capable of] having either a magnetized state or a demagnetized state, said magnetic material having a structure in which layers "A" each [containing as the main component thereof] consist essentially of Fe having magnetism and layers "B" each containing a non-magnetic Cu group metal as the main component thereof are stacked on each other, each of said layers "B" being provided with a shape of a sheet partially divided.

10. (Amended) A magnetic marker having the magnetic material according to claim 6 [or 9], said magnetic material being located so that a bias magnetic field is applied to a magnetostrictive element used for said magnetic marker.